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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/877,724	06/08/2001	Georgios Ginis	STFUP018	8945

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EXAMINER	
CORRIELUS, JEAN B	

ART UNIT	PAPER NUMBER
2637	

DATE MAILED: 01/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/877,724	GINIS ET AL.	
	Examiner	Art Unit	
	Jean B Corrielus	2637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 November 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12,21-32,41-52,61 and 63-87* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *63-87* is/are allowed.

6)☒ Claim(s) *1-12,21-32,41-52 and 61* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/18/05 has been entered.

2. Claim 68, shouldn't "is" be inserted before "performed"? The same comment applies to claims 69, 76, 77,84 and 85.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-4, 6, 8-9, 21-24, 26, 28-29, 41-44, 46, 48-49 and 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art fig. 3 in view of Thomson et al US Patent No. 6,498,820.

As per claim 1, applicant admitted prior art fig. 3 (note that applicants describes fig.1-fig.6 as prior art, it is assumed that those figures are prior art) discloses a method and apparatus for reducing noise comprising having a plurality of communication lines see fig. 3 on which signals are transmitted and received, the signals being affected by interference during transmission, each of the communication lines having at least one transmitter 310 and at least one receiver, 311, the method comprising the steps of: collecting information about line signal and the **actual** interference characteristics of the communication lines using elements 316 (note that as shown in fig. 3, the device 316 is coupled directly to the line, the measurement has to be base on the actual signal carried on the line. Note also applicant's own disclosure page 3, last three lines, that positively recites that the "characteristics of the line 312 is fed back to module 315 by module 316"); creating a model of the line, signal and interference characteristics of the communication lines using elements 314; and processing signals using the model (output of device 314) to remove interference from the signals using device 315. However, as argued by applicant, the admitted prior art does not teach that the model is based on the actual characteristics of the lines. Thomson et al teaches an interference cancellation method and device in which a model is created based on the characteristics of the line see figs. 3-4, col. 6, lines 60-64, col. 7, lines 12-17, lines 28-44, and col. 9, lines 42-51. Given that fact, it would have been obvious to one skill in the art to modify applicant's admitted prior art by creating the model based on the actual characteristics of the line in order to modify the model to account for changes in the

characteristics of the line so as to cancel more effectively interference present in the line.

As per claim 2, the digital communication system is a DSL system see fig. 4. In addition, it would have been obvious to one skill in the art to modify applicant's admitted prior art to carry the step of collecting at common node responsive to signals being affected over a plurality of communication line so as to reduce system complexity and/or cost.

As per claim 3, applicant" admitted prior art teaches only the step of processing the model responsive to signal carried on a single line and does not teach however the step of processing responsive to signals being affected over a plurality of communication lines. However, modifying applicant's admitted prior art to enable the processing to be carried on a plurality of lines would have been obvious to one skill in the art as such would have allowed the method to be used a multichannel environment.

As per claim 4, applicant's admitted prior art inherently synchronizes transmissions of signals between transmitters and receivers (note that in order to establish communication between at least two stations, received signal(s) has to be synchronized with the transmitting entity (ies)(transmitter(s)), and transmitting signal(s) has to be synchronized with receiving entity (receiver(s)) hence such a step is inherently provided by applicant admitted prior art fig. 3.

As per claims 6, 26, and 46, see claim 2 in addition, the admitted prior art further teaches that the signals includes crosstalk signals from adjacent line see page 4, line 7.

As per claims 8, 28 and 48, it would have been obvious to one skill in the art to use QR decomposition to remove interference so as to optimize interference cancellation process. In addition, it would have been obvious to one skill in the art to modify applicant's admitted prior art to carry the step of collecting at common node responsive to signals being affected over a plurality of communication line so as to reduce system complexity and/or cost.

As per claims 9, 29 and 49, it would have been obvious to one skill in the art to collect line signal and interference by a common node responsive to signals being affected over a plurality of communication line so as to reduce system complexity and/or cost.

Claims 21, 41 and 61 are likewise rejected as they include similar limitations as in claim 1.

As per claims 22 and 42 see claim 2.

As per claims 23 and 43 see claim 3.

As per claims 24 and 44 see claim 4.

5. Claims 5, 25 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art fig. 3 in view of Thomson et al and further in view of Koehn et al.

As per claims 5, 25 and 45, as applied to claim 4 above, applicant's admitted prior art fig. 3 and Thomson et al disclose every feature of the claimed invention but do not explicitly teach the synchronizing comprises using block transmission and reception.

However, synchronizing using block transmission and reception is well established in the art for instanced, Koehn et al teaches synchronizing using block transmission and reception see paragraph 0026. Given that it would have been obvious to one skill in the art to incorporate such a teaching in Applicant's admitted prior art and Thomson et al so as to ensure that synchronization time is minimized since the signal would have been processed in block or group rather a bit by bit/symbol by symbol basis.

6. Claims 7, 27 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art fig. 3 in view of Thomson et al and further in view of Wiese et al.

As per claims 7, 27 and 47, as applied to claim 1 above, applicant's admitted prior art fig. 3 and Thomson et al disclose every feature of the claimed invention but do not explicitly teach the interference is removed from the signal on a tone by tone basis. It also fails to teach the step of collecting occurs at a common node responsive to signals affected over a plurality of lines. Wise teaches at col. 3, lines 51-62, the removing of interference from signal on a tone by tone basis. Given that fact, it would have been obvious to one skill in the art to incorporate such a teaching in applicant's admitted prior in order to insure that interference is effectively removed from the signals. In addition, it would have been obvious to one skill in the art to modify applicant's admitted prior art and Thomson et al to carry the step of collecting at common node responsive to signals being affected over a plurality of communication line so as to reduce system complexity and/or cost.

7. Claims 10, 11, 30, 31, 50 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art fig. 3 in view of Thomson et al and further in view of Reusens et al.

As per claims 10, 30 and 50, as applied to claim 1 above, applicant's admitted prior art fig. 3 and Thomson et al disclose every feature of the claimed invention but do not explicitly teach the step of processing signals using the model to remove interference from signals comprises analyzing a weighted sum of the data rates of the signals over the plurality of lines. Reusens et al teaches processing signals using the model to remove interference from signals comprises allocating energy to each user for transmission of the signals (analyzing a weighted sum of the data rates of the signals over the plurality of lines) see paragraph 0002. It would have been obvious to one skill in the art to incorporate such a teaching in applicant's admitted prior art fig. 3 and Thomson et al so as to ensure that data bits are not transmitted via affected or noisy carriers. Note that the signals inherently have to be transmitted or received at a particular data rate.

As per claims 11, 31 and 51, Reusens et al teaches processing signals using the model to remove interference from signals comprises allocating energy to each user for transmission of the signals see paragraph 0002 and would have been obvious to one skill in the art to incorporate such a teaching applicant's admitted prior art and Thomson and the reason to do so would have been the same as provided above with respect to claim 10.

8. Claims 12, 32 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art fig. 3 in view of Thomson et al and further in view of Carrender.

As per claims 12, 32 and 52, as applied to claim 1 above, applicant's admitted prior art fig. 3 and Thomson disclose every feature of the claimed invention but do not explicitly teach the step of processing signals using the model to remove interference from signals occurs at a common node responsive to signals affected over the plurality of communication lines comprises dynamically adjusting a plurality of frequencies used to send the signals. Carrender teaches transmission of signals using a plurality of frequencies and further teaches dynamically adjusting the frequencies used to send the signals. See paragraph 0009. It would have been obvious to one skill in the art to implement such a teaching in applicant's admitted prior art fig. 3 in order to minimize interference between users. In addition it would have been obvious that the step of processing would have occurred at common node responsive to signals affected over a plurality of lines so as to minimize cost and system components.

Allowable Subject Matter

9. Claims 63-87 are allowed. However, the claims must be amended, if necessary to overcome any objection set forth above.

Response to Arguments

10. Applicant's arguments filed on 11/18/05 have been fully considered but they are not persuasive. Applicant's argument in view of the 102(b) rejection is moot in view of the above new ground of rejection. In response to the advisory action mailed on 11/7/05 applicant's representative stated that "module 714" does not model the actual characteristics of the lines and such modeling is performed by "module 715" and applicant's refers to page 17, lines 15-17. However, its noted that such section of the specification most definitely refers rather to the "collecting step" recited in the claim. Note the word "acquired", recited in line 16 that emphasizes that the interference characteristics are measured or acquired. On the other hand, assuming that applicant's is right about the fact that module 715 performs the function of modeling the actual interference characteristics of the line however, it is not clear as to what module performs the step of "collecting actual characteristics on the line"? Clarification is requested.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean B. Corrielus whose telephone number is 571-272-3020. The examiner can normally be reached on Maxi-Flex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jean B Corrielus
Primary Examiner
Art Unit 2637 1-6-06